

**604 SLOPE AND FOUNDATION PROTECTION****604.01 DESCRIPTION**

This work consists of constructing a protective covering of grouted riprap or slope paving along embankment slopes, around culvert inlets or outlets, or placing a graded stone mass around foundations or at such locations as directed by the Chief Engineer, in conformance with grades, dimensions, and details indicated in the contract documents.

Work also includes the necessary excavation, shaping and compacting the foundation, trimming, and cleanup.

**604.02 MATERIALS**

Stone for grouted riprap – [803.10](#)

Stone for foundation protection shall be graded from coarse to fine and meet the same requirements for suitability as listed above for riprap stone

Portland cement – [801.01](#)

Mortar sand – [803.06](#)

Water – [822.01](#)

Welded Wire Fabric – [812.01](#), the weight shall be 30 lbs/100 sq. feet.

**604.03 CONSTRUCTION REQUIREMENTS**

**(A) GENERAL.** Slopes and ground surfaces shall be excavated to lines and grades indicated in the contract documents on plans or as directed by the Chief Engineer.

After this excavation is complete, the area shall be compacted to a density of 93 percent of that determined by AASHTO T 180, Method D. Any poor material shall be removed and suitable fill material placed so that proper compaction can be achieved.

All outer edges and the top of grouted riprap or concrete slope paving, where construction terminates, shall be formed so that surface of the work will be embedded, and even with adjacent slope or ground.

At toe of slopes, the bottom of grouted riprap or concrete slope paving shall be placed at least 3 feet below the finished ground surface unless otherwise indicated.

Construction of all grouted riprap or concrete slope paving shall be started at bottom of slope, progressing upward.

No grouted riprap or concrete slope paving shall be placed during freezing weather nor while there is any ground frost. Cold weather construction shall conform to the requirements of [501.10\(B\)](#).

Grouted riprap and concrete slope paving shall be covered with 2 layers of burlap, meeting the requirements of [814.01](#), and kept wet for 3 days after placement.

- (B) **GROUTED RIPRAP.** All stones shall be hand placed substantially in a single layer, with a 12 inch dimension laid perpendicular to the exposed face. As stones are placed, grout shall be deposited to completely fill all voids between stones. Care shall be taken to secure maximum compaction and density.

Depth of riprap shall be as indicated on the plans in the contract documents and shall not vary more than 2 inches  $\pm$ ; average depth shall be not less than stipulated. Surface of the completed work shall have a neat, rustic appearance, and no grout shall be used to cover surface of stone. Variance from the theoretical surface shall not exceed 2 inches in 10 feet and shall be made as smooth as practicable without cutting or breaking stones.

Grout shall be composed of 1 part portland cement, 3 parts mortar sand, measured by volume and thoroughly mixed dry, and a sufficient quantity of water added afterwards to make a paste of such consistency that it will flow and completely fill all voids.

- (C) **SLOPE PAVING.** Slope paving shall be constructed as a single layer, using a single pour between joints, in conformation with grades, dimensions, and details indicated on the plans in the contract documents. Concrete shall meet requirements of [817, Class F](#) and be mixed and placed in accordance with [501](#), except that volumetric batching may be used.

The concrete shall be finished with a wooden float; all edges shall be neat, using an approved edger.

- (D) **STONE FOUNDATION PROTECTION.** Stone for protection of foundations at abutments, walls, piers, etc., shall be carefully dumped around the foundation, as indicated on the plans or as directed by the Chief Engineer, in such a manner that segregation of the graded stone mass will be kept to a minimum and will produce a reasonably compact and properly sloped mass with minimum voids.

#### 604.04 MEASURE AND PAYMENT

- (A) **GROUTED RIPRAP AND SLOPE PAVING.** The unit of measure for Grouted Riprap and Slope Paving will be the square yard. The actual number of square yards of the specified thickness, complete in place, measured on the exposed surface of the grouted riprap or slope paving will be paid for at the contract unit price per square yard, which payment will include all necessary excavation and its proper disposal, and all labor, materials, tools, equipment, and incidentals necessary to complete the work.
- (B) **STONE FOUNDATION PROTECTION.** The unit of measure for Stone Foundation Protection will be the ton. The actual number of tons complete in place determined by the certified scale weights will be paid for at the contract unit price per ton, which payment will include all labor, materials, tools, equipment, and incidentals necessary to complete the work.